



Risk Reward

What is risk

- Risk in very simple terms is “uncertainty”
 - Risk in day to day life
 - You are planning to take a train scheduled at 10:00 AM
 - You know that the train “usually” arrives late by 10 mins
 - Every day you reach the station at 10:05 and catch the train “most” of the days (you miss the train some times)
 - You have an important meeting (for your promotion) and you need to get on the 10:00 AM train
 - **Will you arrive at 10:05 or come at or before 10:00 AM ?**
 - A prudent person would want to come at or before 10:00 AM
 - If you are planning to arrive on or before 10:00 AM you want to avoid the risk (uncertainty) of the train arriving on time

How are risk and reward related...

- Reward is the benefit (payoff) for doing some thing
 - In this context it is the benefit (payoff) you get by taking the risk
- Coming back to our example.....
 - Arriving at 10:05 gives you that extra time to get your coffee (from a shop that opens only at 10:00!!!)
 - On most days getting your favorite the coffee is worth the chance of missing the 10:00 AM train if it arrives before 10:05 AM (lets say great coffee makes your day and your are ok arriving a few minutes late by taking the next train)
 - On day of an important meeting, getting that favorite coffee may not be worth arriving late (and may be losing out on promotion)
- Rewards should be commensurate with the risks, if one is taking a greater risk one should expect a greater reward
 - PS:
 - You need to remember that even if you arrive at 10:00 AM that the train may not land up that day due to some issue and you still lose out even after not trying to take a risk!!!
 - We don't usually consider the train not arriving as a risk, but the operative word here is **“usually”**!!!
- One needs to remember that extra ordinary events (earth quakes, tsunamis, acts of war, acts of crazy people etc.....) do happen

Coin toss game at Roger's Casino

- Game
 - This involves you betting on outcome of a coin toss
 - You place a bet of Rs 100
 - The dealer tosses a coin and asks you to call heads or tails
 - If you call correctly the dealer will give you Rs 150
 - If you call incorrectly you will forfeit Rs 100
- Will you play this game ?
 - If you are an “expert” coin toss caller you can play the game as you will always be right and will walk out richer (there are very few of these experts, on earth atleast)
 - Being a prudent person you realize you need to be right twice as often as you are wrong just to break even (you need to be right 67% of the time)
 - i.e., if you call incorrectly 10 times you lose Rs 1000 and to win back Rs 1000 you need to call correctly 20 times
- You will make money only when, the number of times you call correctly is more than **double** the number of times you call incorrectly.
- If you rationally expect to be right just half the time then this is a **losing proposition**
- Fine print
 - If you are having an ordinary day you will come out of this game losing money
 - If you are an expert at calling a coin toss or more realistically are having a lucky day you can still come out by winning money
 - We 'd say don't bet on it !!!

Roger is out to get you (actually your money) !!!

Coin toss game at 3 Casino's

	Roger's casino	Fairy's casino	Granny's casino
You bet	Rs 100	Rs 100	Rs 100
Correct call – You get	Rs 150	Rs 200	Rs 250
Incorrect call - You lose	Rs 100	Rs 100	Rs 100
% of time you need to be right to break even	66.6%	50%	40%
On a great day (always right)	You make money	You make money	You make money
On an ordinary day (right half the time)	You lose	You break even	You make money
On a bad day (almost always wrong)	You lose money	You lose money	You lose money
Rationally this is a	Losing proposition	Fair proposition	Great proposition
In summary	Roger is out to get you (actually your money) !!!	Fairy is playing fair	Granny is trying to make you rich!!

Winning is never certain...

- In the real world you can correctly call a coin toss about 50% of the time
 - Given these odds you will prefer to play in Granny's casino as you have the best chance to make money
 - In real world one will be lucky to play in Fairy's casino
 - Usually the granny's will quickly go out of business
 - There will be more casino's like Roger's as Roger will always make money
 - If one is having a bad day, it is possible to lose money in Granny's casino (even when the odds are good)
- ✓ Just like life, outcomes of these games are uncertain and it is always possible to lose.
- ✓ There are no sure bets (even in Granny's casino) and don't believe anyone who say's so!!!

Endurance matters

- Lets say you have the good fortune to play in Granny's casino (before she goes out of business)
 - If you go to Granny's casino with Rs 1000 and get the first 10 games wrong then you don't have any money to play anymore
 - It is important to be able to be in the game to have a chance of winning (capital preservation is important)
 - The longer you can play in Granny's casino the better are your chances of making money
 - If one is having a string of bad luck (always calling incorrectly), then one will lose money even in Granny's casino
- ✓ Even if the odds are good your endurance (ability to play the game for a long time) matters
- ✓ One needs to preserve capital to be able to play the game
- ✓ One can avoid bad judgment but can do little about bad luck

Game of Rolling a die

- Game
 - This involves you betting on outcome of a roll of single dice
 - You place a bet of Rs 100
 - The dealer rolls the die and asks you to call the number on top of the dice
- What should the dealer offer you to play the game ?
 - You will get the call right every 6th time (in the long run)
 - You have a 1 in 6 chance of winning
 - The dealer has to offer your Rs 600 as a reward to make this a fair game
 - In a fair game in the long run no one wins any money (I guess everyone can have fun 😊)
 - If the casino is offering anything less than Rs 600 for the right call a prudent person should not play this game
- Role of a die game has higher risk than the coin toss game hence the dealer needs to offer higher return for one to play the game.
- Taking higher risk means one should look for higher reward (else it is not worth taking the risk)
- Vice versa is not true!! – Any game with high risk does not automatically mean it is offering high return
 - This is one of the reasons that mutual funds are not great investments (more later 😊)
- ✓ Don't take “high risk – high return” literally, it only means that if some one is asking you to take high risk, you need to make sure they are offering you a return commensurate with the risk

Recap of risk and reward

- There is a risk whenever there is uncertainty
- One should only take risks that have commensurate rewards
 - Taking high risk requires higher rewards
 - Higher risks don't necessarily offer high rewards
- “Good odds” does NOT guarantee good outcome, winning is never certain
- Endurance is key, Ability to be in the game for a long time is important to ensure one wins
 - Preserve capital, it will enable you to be able to be in the game
- One can avoid bad judgment, but can do little about bad luck
 - Remember that extra ordinary events (earth quakes, tsunami's, acts of war, acts of crazy people, etc.....) do happen